First Grade Mathematics

By the end of grade one, students understand and use the concept of ones and tens in the base-ten number system. Students understand the meaning of addition and subtraction and add and subtract small numbers with ease. They measure with simple units and extend their understanding of geometric figures in their environment. They represent, describe, and interpret data and analyze and solve simple problems.

Standard I: Students will acquire number sense and perform simple operations with whole numbers.

Objective 1: Represent and use whole numbers up to 100.

a. Count, read, and write whole numbers.
b. Represent whole numbers using the number line, models, and number sentences.
c. Represent whole numbers greater than 10 in groups of tens and ones using objects, pictures, and expanded notation.

Objective 2: Identify simple relationships among whole numbers up to 100.

a. Compare and order sets of objects and numbers using the terms greater than, less than, and equal to when describing the comparisons.
b. Make reasonable estimates of the quantitative difference between two sets of objects.
c. Identify one more, one less, 10 more, and 10 less than a given number.
d. Identify numbers missing from a counting sequence.
e. Represent part-whole relationships using the number line.

Objective 3: Model, describe, and illustrate the meanings of addition and subtraction and use these operations to solve problems.

a. Use a variety of models, including objects, length-based models, the number line and the ten frame to describe problem types (i.e., part-whole, combine, separate, compare).
b. Use the properties of addition (i.e., commutativity, associativity, identity element) and the mathematical relationship between addition and subtraction to solve problems.
c. Compute basic addition facts (up to 10 + 10) and the related subtraction facts using strategies (e.g., 6 + 7 = (6 + 4) + 3 = 10 + 3 = 13).
d. Find the sum of three one-digit numbers.

Mathematical Language and Symbols Students Should Use

add, sum, subtract, difference, greater than, less than, equal to

Exploratory Concepts and Skills

- Use concrete materials to investigate situations that lead to multiplication and division.
- Develop and use strategies for addition and subtraction of multi-digit whole numbers.
- Investigate the meaning of fraction concepts.
- Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.

Standard II: Students will identify and use number patterns and properties to describe and represent mathematical relationships.

Objective 1: Recognize, describe, and represent patterns with more than one attribute.

a. Sort and classify objects using more than one attribute.
b. Identify, create, and label repeating patterns using objects, pictures, and symbolic notation.
c. Identify, create, and label growing patterns using objects, pictures, and symbolic notation.
d. Use patterns to establish skip counting by twos, fives, and tens.

Objective 2: Recognize and represent mathematical relationships using symbols and use number sentences with operational symbols to solve problems.

a. Recognize that "=" indicates that the two sides of an equation are expressions of the same number.
b. Recognize that "+" indicates the joining of sets and that "-" indicates the separation of sets.
c. Write and solve number sentences from problem situations involving addition and subtraction, using symbolic notation for the missing value (e.g., ь+ 4 = 7).
d. Create problem situations from given number sentences involving addition and subtraction.

Mathematical Language and Symbols Students Should Use

sort, attribute, repeating patterns, growing patterns, skip count, number sentence, symbol, +, -, =

Exploratory Concepts and Skills

9 Investigate situations with variables as unknowns and as quantities that vary.

Standard III: Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

Objective 1: Identify, describe, and create simple geometric figures.

a. Name, create, and sort geometric plane figures (i.e., circle, triangle, rectangle, square, trapezoid, rhombus, parallelogram, hexagon).
b. Identify geometric plane and solid figures (i.e., circle, triangle, rectangle, square, trapezoid, hexagon, rhombus, parallelogram, cube, sphere, cone) in the students' environment.
c. Compose and decompose plane and solid figures (e.g., make two triangles from a square) and describe the part-whole relationships, the attributes of the figures, and how they are different and similar.

Objective 2: Identify measurable attributes of objects and units of measurement, and use appropriate techniques and tools to determine measurements.

a. Identify the appropriate tools for measuring length, weight, capacity, temperature, and time.
b. Measure the length of an object using nonstandard units and count the units using groups of tens and ones.
c. Identify the value of a penny, nickel, dime, quarter, and dollar, and determine the value of a set of the same coins that total 25¢ or less (e.g., a set of 5 nickels equals 25¢).
d. Tell time to the hour and half-hour.
e. Name the months of the year and seasons in order, and use a calendar to determine the day of the week and date.

Objective 3: Collect, organize, and represent simple data.

a. Collect and represent data using tables, tally marks, pictographs, and bar graphs.
b. Describe and interpret data.

Mathematical Language and Symbols Students Should Use

circle, triangle, rectangle, square, trapezoid, hexagon, rhombus, parallelogram, cube, sphere, cone, penny, nickel, dime, quarter, dollar, January, February, March, April, May , June, July, August, September, October, November, December, winter, spring, summer, fall, data, value, graph, tally mark

Exploratory Concepts and Skills 9

Compare objects using non-standard units.
9 Interpret data from charts and graphs.